comparatively small apparatus, secured the highest record yet established. With another engine a gain in weight of steam supplied the engine amounting to nearly 40 per cent. was effected, and in weight of fuel 28 per cent; the difference being due, obviously, to the fact that each unit-weight of steam carried an abnormal quantity of stored heat.

Professor Sinigaglia concludes:

1. Superheating vapor is irrefutably proved to be the most effective system of reduction of internal wastes of heat in the steam-engine.

2. The higher the degree of superheating attainable, the nearer does the thermodynamic result approximate that indicated by pure theory and by the formulas of thermodynamics.

3. From the industrial point of view, it is necessary to note the gain, not at the engine, but in fuel demanded at the boiler, and the apparatus of vaporization and of gasification must be efficient and durable.

4. The final test is in the study of the financial aspect of the operation.

"Mais, aujourd'hui, les installations nombreuses de l'Alsace et de l'Allemagne ont donné des résultats si remarkables qu'on finira par vaincre les dernières difficultés qui s'opposent á une application générale de la surchauffe aux machines à vapeur. Ce sera le meilleur hommage rendu à Hirn et à son école."

R. H. THURSTON.

## THE REMOVAL OF DR. WORTMAN TO THE CARNEGIE MUSEUM.

DR. J. L. WORTMAN, of the American Museum of Natural History, has been called to take charge of the new collections of Vertebrate fossils in the Carnegie Museum at Pittsburgh, and has resigned his position in the American Museum in order to enter upon his new duties. The finest portions of the Cope collection of Fossil Mammals were made by Dr. Wortman previous to his connection with the Army Medical Museum in Washington. Since 1890 he has had charge of most of the parties sent out from the American Museum for Fossil Mammals and Reptiles and has conducted these explorations with extraordinary success. A very large part, therefore, of the collections in the Department of Vertebrate Paleontology are due to the energy and intelligence of Dr. Wortman and his assistants in the field. His field work has been carried on almost exclusively during the summer months, and he has been occupied during the winters in the preparation of a series of bulletins based chiefly upon the field collections, many of which have attracted wide attention. Notable among these are the papers upon the Skeleton of *Patriofelis*, the Anatomy of *Agriochœrus*, the revision of all the early species of horses, and a geological paper upon the Stratigraphy of the White River Beds. The most important of his original contributions in the series is, however, that upon the 'Origin of the Sloths,' based chiefly upon the fortunate discovery of the foot of *Psittacotherium* in the Torrejon beds of New Mexico. Dr. Wortman's latest paper, now in press, is upon the Ancestry of the Dogs, in which he successfully demonstrates the direct phylogenetic relationship between the Canidæ and of certain dog-like Creodonts.

Dr. Wortman's services to the Museum are greatly appreciated and his resignation has been accepted with much regret. He carries with him the best wishes of his friends for his success in his new undertaking.

H. F. O.

## SCIENTIFIC NOTES AND NEWS.

PROFESSOR F. L. O. WADSWORTH has been appointed by the managers of the Western Pennsylvania University, Director of the Allegheny Observatory, succeeding in the position Professors Keeler and Langley. Professor Wadsworth has been connected with Yerkes Observatory since its opening and was previously at the Astrophysical Observatory of the Smithsonian Institution.

UNDER authority of the Secretary of the Treasury, the Superintendent of the Coast and Geodetic Survey has effected a reorganization in that Bureau in such a way as to relieve the head of the Bureau of a certain amount of the routine work and to insure also a more direct supervision of the field work. The following officers have been appointed: Assistant Superintendent, Mr. O. H. Tittman; Assistant in charge of the Office, Mr. Andrew Braid; In-

spector of Field Work in Hydrography and Topography, Mr. H. G. Ogden; Inspector of Field Work in Geodesy, Mr. John F. Hayford; Inspector of Field Work in Terrestrial Magnetism, Dr. L. A. Bauer.

M. Prilleux, known for his researches on the parasitic diseases of plants, has been elected a member of the Section of Botany of the Paris Academy of Sciences. The other candidates nominated by the Section were MM. Bureau, Maxime, Cornu, Renault and Zeiller.

Three botanists—Professors E. Pfitzer, of Heidelberg; O. Brefeld, of Münster, and E. Warmung, of Copenhagen—have been elected corresponding members of the Berlin Academy of Sciences.

Mr. W. H. Preece, C.B., F.R.S., has accepted the presidency of the 18th Congress of the Sanitary Institute, to be held in Southampton from August 29th to September 2d.

Cambridge University has conferred the degree of Doctor in Science, *honoris causa*, on Alexander Kowalevsky, professor of zoology in the Imperial University, St. Petersburg.

The Prince of Monaco has been elected an honorary member of the Royal Geographical Society of London.

Mr. Philip Thomas Main, Fellow of St. Johns College, Cambridge, died on May 5th. He lectured on chemistry at St. John's College and did much to promote the study of natural science in the College and in the University. He was also the author of a treatise on astronomy which has passed through several editions.

Mr. Henry William Jackson, a retired surgeon, died at Louth, Lincolnshire, on May 14th, aged 67 years. He founded the Lewisham and Blackheath Scientific Association and was interested in anthropology and astronomy, being a member of the London and Paris Anthropological Societies and a Fellow of the Royal Astronomical Society.

Through some as yet unknown 'accident,' the annual appropriation for the N. Y. State Weather Service were stricken out of the appropriation bill, April 24th last, and it is thus apparently impossible to continue a series of observations, meteorological and agricultural, that has been carried on without interruption for a generation. In this service, which has its headquarters at Ithaca, in the College of Civil Engineering, nearly 2,500 persons are engaged without cost to the State, including the Director of that College, who is also the Director of the Service. The work of the Bureau has been largely in the interests of the farmers of the State, and the compilation of weekly 'Crop Bulletins,' and the maintenance of a weather-signal station, which operates in conjunction with the U. S. Bureau at Washington, has been considered an important service to the whole Commonwealth. The minute appropriations hitherto made, but $4,500 per annum, by the great State of New York have been entirely inadequate to the opportunities of the Bureau; but the volunteer labor of a corps whose services, if fully compensated, would amount to probably over a quarter of a million of dollars annually have gone far to make up for the defect. Even if re-established, this interruption for a single year will make a break in the files which can never be repaired and which may deprive the State of previously interested, and even enthusiastic, observers by so disheartening them that they will not resume their connection with the system; thus destroying stations having records of a length approximating thirty years.

A meeting was held on May 20th, at Columbia University, for the purpose of discussing the formation of an American Physical Society, which would hold meetings in New York for the reading and discussion of papers. The meeting was called by the following committee of physicists, representing important American universities: Professor A. G. Webster, Clark University, Worcester; Professor J. S. Ames, Johns Hopkins University, Baltimore; Professor E. L. Nichols, Cornell University, Ithaca; Professor Carl Barus, Brown University, Providence; Professor M. I. Pupin, Columbia University, New York; Professor B. O. Peirce, Harvard University, Cambridge; Professor W. F. Magie, Princeton University, Princeton. It is intended that the new organization shall be for this country what the Physical Society is for England and the Deutsche physikalische Gesellschaft for Germany.

THE Council of the American Chemical Society has authorized the establishment of a section to be known as the Philadelphia Section, with headquarters in Philadelphia, Pa., having a territory with a radius of sixty miles from the Philadelphia City Hall.

THE foundation-stone of the extension of South Kensington Museum, henceforward to be known as the Victoria and Albert Museum, was laid by Queen Victoria on May 17th. Several members of the royal family, foreign diplomatists and members of both Houses of Parliament were among those attending. The Duke of Devonshire, the Home Secretary, and Mr. Akers-Douglas took a prominent part in the proceedings. The Prince of Wales assisted the Queen in the actual laying of the foundation-stone.

A BILL has been introduced into the British Parliament for establishing a Department of Agriculture and other Industries and Technical Instruction in Ireland, and for other purposes conected therewith.

THE United States Civil Service Commission announces that applicants for the position of Inspector of Standards (Office of Standard Weights and Measures), U. S. Coast and Geodetic Survey (Treasury Department), at a salary of $3,000 per annum, will be permitted to file their applications as late as July 15, 1899, instead of June 1, 1899, as previously announced.

THE Examiners of the U. S. Civil Service Examination for a "*Sloyd* Teacher" in the Indian Service (Dept. Interior) failed to find candidates, April 11th. The examination will now be held June 6th–7th and the successful applicant will receive $600 per annum for teaching "basket *Sloyd*" and carving.

MAYOR VAN WYCK, of New York, has signed the resolution of the Municipal Assembly providing for the issue of $500,000 bonds to defray the expenses of removing the old reservoir from Bryant Park and building the foundations for the new library. The contract for the work will be let immediately by the Board of Estimate, and the work of tearing down the reservoir will be begun as soon as practicable.

AN anonymous gift of $25,000 has been made to Long Island College Hospital for the endowment of a fellowship in the department of pathology. The gift is to be known as the Van Cott Fellowship, in honor of Dr. Joshua Van Cott, the director of the laboratory.

THE French Chamber of Deputies has voted an annual appropriation of 92,000 fr. for the publication of the Photographic Atlas of the Stars.

THE French Association for the Advancement of Science will meet at Boulogne on the 14th of September, 1899. As we have already stated, the British Association will meet at the same time at Dover, the meetings of the two Associations having been arranged so as to provide for an exchange of hospitalities.

THE Indian Plague Commission has returned to London and is continuing its meetings in that city.

THE daily papers report that a letter from Andrée has been found on the northeast coast of Iceland and has been forwarded, as addressed, to Gothenburg, Sweden.

AN exhibition is being arranged at The Hague to illustrate what was accomplished by the Netherlands prior to the present century in navigation, discoveries, trade and fisheries. Those in America who possess objects that might be useful for exhibition are requested to communicate with the Honorary Secretary, Mr. G. P. Van Hecking Côlenbrander, The Hague.

WE learn from the London *Times* that the two royal gold medals of the Royal Geographical Society have this year been awarded to two Frenchmen, both of them distinguished explorers. Only one French explorer, Francis Garnier, has hitherto figured on the Society's list of honors, and only one other Frenchman, Elisée Reclus. The founder's medal has this year been awarded to Captain Binger, who in the years 1887–89 carried out an extensive series of explorations in the vast area included in the bend of the Niger. During these journeys Captain Binger explored much country previously unknown, took numerous astronomical observations on which to base a map of the region, and in other departments of geography did a great amount of work of high scientific value. The results of Captain Binger's explorations were published in 1892 in

two large volumes, with one large map and several smaller maps and sections and numerous valuable illustrations, which form the chief authority on the geography of the region with which they deal. The patron's medal has been awarded to M. Foureau for his explorations in the Sahara during the last twelve years. In his journey to Insalah in 1890 he travelled over 1,500 miles and fixed the latitudes and longitudes of 35 places; in 1891 he penetrated farther into the Sahara than any other explorer since the Flatters mission, and determined the positions of 41 places; in 1893 he penetrated as far as the Tassili plateau; in 1894–95 he again covered much new ground and made numerous astronomical observations to fix positions, besides making researches in physical geography, geology and botany; in 1896 and in his present journey he contributed still further to geographical knowledge. The whole comprises an amount of continuous scientific work under great difficulties which places M. Foureau in the first rank of African explorers. Few men have done so much to elucidate the topography and the physical geography of the Sahara. The Murchison award has been given to Mr. Albert Armitage for his valuable scientific observations and for his sledge journeys with Mr. Jackson in Franz Josef Land; the Gill memorial to the Hon. David Carnegie for his journey across the Western Australian desert from Coolgardie to Hall's Creek and back by a different route, thus traversing the desert twice; the Cuthbert Peek grant to Dr. Nathorst for his important scientific exploration of the Spitzbergen Islands and the seas between Spitzbergen and Greenland; the Back grant to Captain Sykes for his three journeys through Persia, during which he has made important corrections and additions to the map of that country and done much to clear up the geography of Marco Polo. These honors will be awarded at the anniversary meeting of the Society on June 5th, and at the same time the American Ambassador will present to Sir John Murray the gold medal of the American Geographical Society for his valuable contributions to scientific geography.

The 30th annual meeting of the Iron and Steel Institute of Great Britain was opened on May 4th in the hall of the Institution of Civil Engineers, Westminster. The chair was occupied in the first instance by the retiring President, Mr. Edward P. Martin, who introduced his successor, Sir William Roberts-Austen, who delivered the inaugural address. The report of the Council for the past year was read by the Secretary, Mr. Bennett H. Brough, and showed that during 1898 the number of members was increased by 98, the total number on the roll at the end of the year being 1,522. With 57 members elected at the present meeting the total numerical strength of the Institute was brought up to 1,579. To the list of honorary members the names of King Oscar II. of Sweden and Norway and Baron Gustav Tamm, Governor-General of Stockholm and President of the Association of Swedish Ironmasters, were added during the past year. The annual dinner was held on the evening of May 4th, at which speeches were made by the Chairman, Sir William Roberts-Austen; Mr. Horace Seymour, Deputy-Master of the Mint; Sir William White, Director of Naval Construction; Sir H. Brackenbury, Director-General of Ordnance; Professor Rücker, Lord Lister, Lord Strathcona, Mr. Preece and others.

The Sixth International Congress on Commercial Education opened at Venice on May 4th, under the presidency of Signor Pascolata. It will next meet at Paris on August 26, 1900.

The report of the Council presented at the seventieth anniversary meeting of the Zoological Society of London stated that the number of Fellows on December 31, 1898, was 3,185, showing an increase of 27 during the past year, and the number of Fellows on the roll was in excess of what it had been in any year since 1885. The total income during the past year had been £29,208, being £495 more than that of 1897, and £3,357 in excess of the average during the preceding ten years. The increase in the income was attributable to the larger amounts received for admission fees, compositions and subscriptions, and also to the augmentation of the miscellaneous receipts caused by a contribution of Mr. Walter Rothschild, M.P., towards the outlay on the new tortoise house, built in 1898. The ordinary expenditure of the Society for 1898 had amounted to

£25,979, which was an increase of £649 over that for 1897. A sum of £3,718 had also been paid to extraordinary expenditure, having been devoted mainly to the construction of new buildings in the gardens and to the acquisition of a young male giraffe, which, although it arrived in apparently good health, did not, unfortunately, live long in the gardens. After payment of the ordinary and extraordinary expenditure a balance of £1,584 had been carried forward. The number of visitors to the gardens in 1898 had been 710,848, being 6,707 less than the corresponding number in 1897. The number of animals living in the gardens on December 31st last was 2,656, of which 818 were mammals, 1,363 birds and 475 reptiles and batrachians.

CONSUL-GENERAL HOLLOWAY, of St. Petersburg, sends to the Department of State, under date of March 28, 1899, translation of an article from the 'Novoe Vremia' of the 17th instant, referring to the first trip of the new 10,000-ton ice boat recently built in England for the purpose of keeping the ports of St. Petersburg and Riga open during the winter months, as follows: The ice boat *Ermak* arrived at Cronstadt March 5th–17th. This boat was made after plans prepared by Admiral Makaroff and built in England. Owing to the fogs, it had to remain two days in Belt. Near Reval it met with very thick ice, but still continued moving at 7 knots per hour. Near Seskei it met with large fields of ice, from 9 to 10 feet above the water line. Here the *Ermak* could not move on; but, with the aid of its machinery, it acquired a swinging motion, and the water running out of a special apparatus in the boat melted the ice under the vessel, which moved on, dispersing the ice mountains. The ice boat presses on the ice with its prow; the screw that is under it lets out water, which softens the ice, and the movement of the screw makes the ice go under it and breaks it into rather small pieces. This ice boat has no keel and should, therefore, be subject to great rolling, but, in order to avoid this, there is a receptacle in the hull of the vessel, filled with water, which is arranged in such a way that the water does not allow the vessel to sway too much one side or the other, and keeps it in equilibrium. The boat was met at Cronstadt with great triumph and music. Hundreds of people went out to meet it, running alongside of it on the ice. The ice boat belongs as yet to the Ministry of Finance. It is at the same time a passenger boat, a freight boat and a tug boat. It can accommodate nineteen first-class passengers, for which it has a fine cabin, decorated with imperial portraits, with double windows, double illuminators, and a special ventilator, which lets warm air into the cabin. The walls are of oak. The boat is lighted by electricity. On March 31st the Consul-General adds: "The new iceboat *Ermak* left Cronstadt on the 25th of March and opened the port of Reval, plowing through from 16 to 18 feet of ice, releasing three commercial steamers that were frozen fast some distance from the shore. On the morning of March 27th the *Ermak* left Reval, clearing the way to the sea for four vessels. During the first four days of the *Ermak's* arrival at Russian ports she released sixteen vessels from the ice and opened the way for them to proceed to sea."

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*UNIVERSITY AND EDUCATIONAL NEWS.*

MR. SAMUEL CUPPLES has increased his gift of $150,000 for a building for Washington University, St. Louis, to $250,000 for two buildings.

MR. MAXWELL SOMMERVILLE has presented to the University of Pennsylvania his collection of engraved gems and ethnological collections, said to be of the value of $600,000.

THE *Jewish Chronicle* publishes full details of the bequests of Baroness de Hirsch. They amount in all to about $9,000,000, which is distributed chiefly among Hebrew charities throughout the world. The bequests include 7,000,000 fr. to the Teachers' Training School of the Hebrew Alliance at Paris and 3,000,000 fr. for elementary education in Galicia.

NECESSARY alterations are being made in the physical laboratory of Western Reserve University in order to erect an observatory upon it. The University has recently received a gift of a ten-inch refractor made by Messrs. Warner and Swasey. Mr. Samuel Mather, the donor of the laboratory, has offered to bear the expense of mounting the instrument.